Arkansas   Grade 8

FlyBy Math™ Alignment
Arkansas Mathematics Curriculum Framework

Strand: Number and Operations

Standard 3: Numerical Operations and Estimation
Students shall compute fluently and make reasonable estimates

Student Learning Expectation	*FlyBy Math*™ Activities
NO.3.8.3 Use *estimation* to solve problems involving *rational numbers*; including *ratio*, *proportion*, *percent* (increase or decrease) then judge the reasonableness of solutions	--Predict outcomes and explain results of mathematical models and experiments. --Compare predictions, calculations, and experimental evidence for several aircraft conflict problems.

Strand: Algebra

Standard 4: Patterns, Relations and Functions
Students shall recognize, describe, and develop patterns, relations and functions

Student Learning Expectation	*FlyBy Math*™ Activities
A.4.8.2 Using real world situations, describe *patterns* in words, tables, pictures, and symbolic representations	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.
A.4.8.3 Interpret and represent a two operation *function* as an *algebraic equation* Ex. $y=2x+1$	--Represent distance, speed, and time relationship for constant speed cases using linear equations and a Cartesian coordinate system. --Interpret the slope of a line in the context of a distance-rate-time problem.

Standard 5: Algebraic Representations
Students shall represent and analyze mathematical situations and structures using algebraic symbols

Student Learning Expectation	*FlyBy Math*™ Activities
A.5.8.2 Solve and graph *linear equations* (in the form $y=mx+b$)	--Represent distance, speed, and time relationship for constant speed cases using linear equations and a Cartesian coordinate system.

Standard 6: Algebraic Models Students shall develop and apply mathematical models to represent and understand quantitative relationships	
Student Learning Expectation	***FlyBy Math*^{TM} Activities**
A.6.8.1 Describe, with and without appropriate *technology*, the relationship between the graph of a line and its equation, including being able to explain the meaning of slope as a constant rate of change (rise/run) and *y-intercept* in real world problems	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions. --Interpret the slope of a line in the context of a distance-rate-time problem.
A.6.8.2 Represent, with and without appropriate *technology*, *linear* relationships concretely, using tables, graphs and *equations*.	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.

Standard 7: Analysis of Change Students shall analyze change in various contexts	
Student Learning Expectation	***FlyBy Math*^{TM} Activities**
A.7.8.1 Use, with and without *technology*, graphs of real life situations to describe the relationships and analyze change including graphs of change (cost per minute) and graphs of accumulation (total cost)	--Compare airspace scenarios for both the same and different starting conditions and the same and different rates. --Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

Strand: Geometry

Standard 10: Coordinate Geometry Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems	
Student Learning Expectation	***FlyBy Math*^{TM} Activities**
G.10.8.1 Use coordinate geometry to explore the links between geometric and algebraic representations of problems (lengths of segments/distance between points, *slope*/*perpendicular-parallel lines*)	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.

Strand: Measurement

Standard 13: Systems of Measurement
Students shall identify and use units, systems and processes of measurement

Student Learning Expectation	*FlyBy Math*™ Activities
M.13.8.1 Draw and apply measurement skills with *fluency* to appropriate levels of precision	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.
M.13.8.3 Apply proportional reasoning to solve problems involving indirect measurements, scale drawings or rates	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation. --Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

Strand: Data Analysis and Probability

Standard 14: Data Representation
Students shall formulate questions that can be addressed with data and collect, organize and display

Student Learning Expectation	*FlyBy Math*™ Activities
DAP.14.8.1 Design and conduct investigations which include • adequate number of trials • unbiased sampling • accurate measurement • record-keeping	--Conduct simulation and measurement for several aircraft conflict problems. --Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.
DAP.14.8.3 Interpret or solve real world problems using data from charts, *line plots, stem-and leaf plots, double-bar graphs, line graphs, box-and whisker plots, scatter plots, frequency tables or double line graphs*	--Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.